

Patent claims:

- 1 1. Device for controlling a piezoelectric actuator, in particular a fuel injection  
2 valve of an internal combustion engine, comprising an energy source which supplies  
3 the actuator with energy, whereby the extension of the piezoelectric actuator  
4 corresponds with a predetermined response to changes in temperature, and a  
5 compensation capacitor which is connected in parallel with the piezoelectric actuator  
6 for which the capacitance is dimensioned in such a way that, for a constant amount of  
7 energy delivered by the energy source the extension of the actuator is almost constant  
8 across the temperature range.
- 1 2. Device according to Claim 1, wherein the energy source, a controller  
2 controlling the energy source and a compensation capacitor are accommodated in a  
3 housing and are connected via a cable with the piezoelectric actuator.
- 1 3. Device in accordance with Claim 1, wherein the energy source, a control  
2 circuit controlling the energy source, the compensation capacitor, and the piezoelectric  
3 actuator are accommodated in a housing, whereby the control circuit can be controlled  
4 by an external controller.
- 1 4. Device in accordance with Claim 1, wherein the compensation capacitor has a  
2 capacitances of around 10,5 $\mu$ F.
- 1 5. Device according to Claim 3, wherein the housing is a fuel injection valve  
2 housing.
- 1 6. Device according to Claim 3, further comprising a temperature sensor coupled  
2 with the external controller for determining the temperature of the housing.
- 1 7. Device according to Claim 2, further comprising a measurement line coupled  
2 with the controller and the actuator used to determine the voltage at the actuator.

- 1 8. Device according to Claim 2, further comprising a temperature sensor coupled
- 2 with the actuator and electrically coupled with a measurement line used to transmit the
- 3 temperature value of the actuator to the controller.

- 1 9. Method for controlling a piezoelectric actuator, in particular a fuel injection  
2 valve of an internal combustion engine, comprising the steps of:
- 3 - supplying the actuator with energy, whereby the extension of the piezoelectric  
4 actuator corresponds with a predetermined response to changes in temperature, and  
5 - compensating the extension of the piezoelectric actuator by means of capacitor  
6 coupled in parallel with the actuator, wherein the capacitance is dimensioned in such a  
7 way that, for a constant amount of energy delivered by the energy source the extension  
8 of the actuator is almost constant across the temperature range.
- 1 10. Method according to Claim 9, further comprising the step of sensing the  
2 voltage of the actuator.
- 1 11. Method according to Claim 9, further comprising the step of sensing the  
2 temperature of the actuator.

- 1 12. Fuel injection valve comprising:  
2 - a piezoelectric actuator;  
3 - an energy source which supplies the actuator with energy, whereby the extension of  
4 the piezoelectric actuator corresponds with a predetermined response to changes in  
5 temperature, and  
6 - a compensation capacitor which is connected in parallel with the piezoelectric  
7 actuator for which the capacitance is dimensioned in such a way that, for a constant  
8 amount of energy delivered by the energy source the extension of the actuator is  
9 almost constant across the temperature range.
- 1 13. The valve according to Claim 12, wherein the energy source, a controller  
2 controlling the energy source and a compensation capacitor are accommodated in a  
3 housing and are connected via a cable with the piezoelectric actuator.
- 1 14. The valve in accordance with Claim 12, wherein the energy source, a control  
2 circuit controlling the energy source, the compensation capacitor, and the piezoelectric  
3 actuator are accommodated in a housing, whereby the control circuit can be controlled  
4 by an external controller.
- 1 15. The valve in accordance with Claim 12, wherein the compensation capacitor  
2 has a capacitances of around 10,5 $\mu$ F.
- 1 16. The valve according to Claim 14, wherein the housing is the housing of the  
2 fuel injection valve.
- 1 17. The valve according to Claim 14, further comprising a temperature sensor  
2 coupled with the external controller for determining the temperature of the housing.
- 1 18. The valve according to Claim 13, further comprising a measurement line  
2 coupled with the controller and the actuator used to determine the voltage at the  
3 actuator.

- 1 19. The valve according to Claim 13, further comprising a temperature sensor
- 2 coupled with the actuator and electrically coupled with a measurement line used to
- 3 transmit the temperature value of the actuator to the controller.